

**REMARKS**

Claims 1 and 7-9 are presently pending in the application.

Claims 4 and 5 have been canceled. Claim 1 has been amended to recite that a metal ratio of a salicylate detergent in Component (C) is 1.5 or less, which is supported at least in canceled claim 4 and in the specification at page 5, lines 14-22 and in Example 5. Claim 1 has also been amended to recite that a total sulfur content of the composition is 0.05 percent by mass or less, which is supported at least at page 37, last 18 lines; at page 39, lines 8-11; and in Example 5. No new matter has been added by these amendments, and entry is respectfully requested.

**Rejection Under § 103(a) Based on Nakazato in view of Minami or Nishikawa**

In the Office Action, the Examiner has again rejected claims 1, 4, and 7-9 under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,569,818 of Nakazato ("Nakazato") in combination with U.S. Patent No. 5,792,733 of Minami et al. ("Minami") or U.S. Patent No. 5,245,070 of Nishikawa et al. ("Nishikawa"). Briefly, the Examiner again argues that Nakazato teaches a lubricating oil composition having specific phosphorus, sulfur, and sulfated ash contents which comprises: (a) a major amount of a specific mineral base oil having a low sulfur content, (b) an ashless alkenyl or alkyl-succinimide dispersant or derivative thereof, and (c) a metal-containing detergent such as an alkali metal or an alkaline earth metal salt of an alkylsalicylic acid. The composition may allegedly include other metal detergents, such as sulfonate detergents, (d) a zinc dialkyl-dithiophosphate in an amount of 0.01 to 0.1 weight % in terms of phosphorus content, and (e) an oxidation inhibitor which may be a phenol compound or an amine compound.

The Examiner further argues that Nakazato teaches that the lubricating oil compositions may contain other auxiliary additives, such as phosphoric acid esters and phosphorous acid esters. The Examiner acknowledges that Nakazato does not teach or suggest the claimed specific phosphorus acid ester compound, a triphosphate of formula (1). However, the Examiner argues that such triphosphate compounds are well known in the art as antiwear agents in lubricating oil compositions, as evidenced by Minami or Nishikawa. The Examiner thus concludes that it

would have been obvious to one having ordinary skill in the art at the time of the invention to have added the triphosphate compound of Minami or Nishikawa to the oil composition of Nakazato if its known imparted properties were so desired.

In response to Applicants' previous arguments, the Examiner takes the position that it is not clear that the results that have been presented are unexpected to one of ordinary skill in the art, and that the increase in slipping velocity is due to the presence of a high amount of sulfur in the comparative example which is not required to be present in the Nakazato compositions. Finally, the Examiner maintains that it would have been obvious to one skilled in the art to have omitted the conventional zinc dialkyldithiophosphate component from the lubricating oil composition of Nakazato if the function attributed to the component was not desired or required. Applicants again respectfully traverse this rejection as follows.

The presently claimed invention is directed to a lubricating oil composition which contains no ZnDTP and contains, in part, a salicylate detergent having a metal ratio of 1.5 or less. The composition also has a total sulfur content of 0.05 percent by mass or less. The advantageous effects achieved by the presently claimed composition are clearly demonstrated in Table 1 of the present application. For example, the composition of (inventive) Example 5, which *contains no ZnDTP*, contains a calcium salicylate detergent with a metal ratio of 1.0 (within the claimed range), and has a sulfur content of 0.05% by mass, exhibited excellent slipping velocity, having an average value of 0.105 (100 mm/s) in the LFW-1 boundary friction test. In comparison, (comparative) Example 7, having a sulfur content of 0.07% by mass, exhibited an average slipping velocity of 0.116. Accordingly, the total sulfur content of the composition has an effect on the slipping velocity.

As previously explained on the record, Nakazato teaches a lubricating oil composition having specific phosphorus, sulfur, and sulfated ash contents and containing: (a) a mineral base oil, (b) an ashless alkenyl or alkyl-succinimide dispersant, (c) a metal-containing detergent, (d) ZnDTP in an amount of 0.01 to 0.1 wt % in terms of phosphorus content, and (e) an oxidation inhibitor. The Examiner argues that the ZnDTP is contained in the Nakazato composition in a very minor amount of 0.01 wt% in terms of P content, and that it has been held that the elimination of an element is obvious if the function of the element is not desired.

Initially, Applicants respectfully submit that the Examiner has not established where Nakazato teaches or suggests a salicylate detergent having a metal ratio of 1.5 or less as claimed,

and even the proposed combination with Minami or Nishikawa would not cure such a deficiency with Nakazato.

Further, although Nakazato teaches the total content of sulfur in the composition is 0.01 to 0.3 percent by weight, Nakazato only exemplifies compositions containing sulfur in amounts of 0.07 percent by weight or greater. While prior art references are not limited to what is exemplified, Applicants respectfully submit that based on Nakazato, one skilled in the art would not have been motivated to utilize 0.05 percent by mass or less of sulfur as claimed. Applicants' invention may be regarded as a selection invention, in which Applicants have discovered the optimum sulfur content required to provide a composition with superior results. Since Nakazato does not distinguish between compositions having 0.01 percent by weight sulfur and those having 0.3 percent sulfur, and in fact exemplifies only compositions containing 0.07 to 0.11 percent sulfur, one skilled in the art would only have been motivated based on Nakazato to utilize sulfur amounts of greater than 0.07 percent. It would also not have been expected based on Nakazato that utilization of 0.05 percent by weight or less of sulfur would provide the superior properties exhibited by the presently claimed composition.

The Examiner takes the position that Nakazato teaches the addition of conventional ZnDTP to the composition in a very minor amount of 0.01 weight % in terms of phosphorus content, and that the skilled artisan would have been motivated to remove an element if the function of that element was not desired. Applicants respectfully again traverse this argument. Applicants cannot conceive of why, based on Nakazato, one skilled in the art would have been motivated to eliminate an essential component of a composition. The Examiner has further not addressed Applicants' previous arguments.

As previously explained on the record, Nakazato teaches that the ZnDTP compound preferably contains an alkyl or alkylaryl group having 3 to 18 carbon atoms. Particularly preferred are alkyl groups derived from a secondary alcohol or a mixture of secondary and primary alcohols, since the latter are taught to provide high heat resistance (col. 6, lines 30-37). Applicants respectfully cannot understand why one skilled in the art would have been motivated based on Nakazato to omit a component which is taught to be essential and which is taught to provide desirable high heat resistance. If such a component were intended to be optional, it would have been included by Nakazato in the list of *optional* auxiliary additives described at col. 7, line 59 to col. 8, line 11. Applicants do not agree that one would have been motivated to

eliminate ZnDTP from the lubricating oil composition in order to eliminate high heat resistance (high temperature detergency) of the composition.

The Examiner again cites MPEP § 2144.04 as teaching that “omission of an element and its function is obvious if the function of the element is not desired.” The MPEP describes the case cited by the Examiner (*Ex parte Wu*, 10 USPQ 2031 (Bd. Pat. App. & Inter. 1989)):

The claims at issue were directed to a method for inhibiting corrosion on metal surfaces using a composition consisting of epoxy resin, petroleum sulfonate, and hydrocarbon diluent. The claims were rejected over a primary reference which disclosed an anticorrosion composition of epoxy resin, hydrocarbon diluent, and polybasic acid salts wherein said salts were taught to be beneficial when employed in a freshwater environment, in view of secondary references which clearly suggested the addition of petroleum sulfonate to corrosion inhibiting compositions. The Board affirmed the rejection, holding that it would have been obvious to omit the polybasic acid salts of the primary reference where the function attributed to such salt is not desired or required, such as in compositions for providing corrosion resistance in environments which do not encounter fresh water.

In such a situation, if the metal was to be used in a non-freshwater environment, it would have been reasonable to omit from the corrosion-inhibiting composition the component which provided corrosion resistance in freshwater, since such a component would have been superfluous. The resulting composition would still be expected to provide the same corrosion resistance, albeit in a different environment.

Applicants respectfully submit that such a situation is completely different from the claimed case. In contrast with the case cited by the MPEP, the Examiner is arguing that one skilled in the art would have been motivated to omit ZnDTP from the Nakazato composition in order to provide a lubricating composition with inferior high temperature properties. Nakazato teaches the lubricating oil compositions are useful in motor driven vehicles using low sulfur hydrocarbon fuels, particularly diesel engine-mounted vehicles (col. 3, lines 54-56), and that the compositions have stability at high temperature so that they can meet exhaust gas regulations (col. 2, lines 30-32). Accordingly, based on the teaching of Nakazato, the modified composition proposed by the Examiner would be an inferior composition which would not meet the objectives of Nakazato. The proposed composition would not be a composition that provided the same properties as the Nakazato composition but was for use in a different environment.

Accordingly, Applicants again respectfully submit that there would have been no motivation to modify the Nakazato composition as proposed by the Examiner.

As demonstrated above, it would not have been expected based on Nakazato that elimination of ZnDTP would yield a composition that exhibits the properties of the presently claimed composition. Applicants' invention may thus be considered as a selection invention in a second way: Applicants have determined that omitting ZnDTP, a well-known lubricating oil additive which is known to be effective as an antioxidant and extreme pressure/antiwear agent, would result in a superior composition.

For at least these reasons, the presently claimed composition would not have been obvious based on Nakazato, and even modification of the Nakazato composition to include a triphosphate compound of Minami or Nishikawa would still yield a composition containing ZnDTP, since neither of the secondary references would provide a motivation for omitting ZnDTP from the Nakazato composition.

Accordingly, no *prima facie* case of obviousness has been established based on the proposed combination of references, and reconsideration and withdrawal of the § 103(a) rejection based on Nakazato in view of Minami or Nishikawa are respectfully requested.

*Rejection Under § 103(a) Based on Ho in view of Minami or Nishikawa*

The Examiner has again rejected claims 1-5 and 7-9 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,001,780 of Ho et al. ("Ho") in view of Minami or Nishikawa. The Examiner maintains that Ho discloses an ashless lubricating oil composition that comprises: (a) a major amount of base oil of lubricating viscosity; (b) from about 1 to 6 wt% of an untreated borated succinimide dispersant; and (c) from about 1 to 6 wt% of a borated succinimide dispersant. Ho allegedly teaches that the lubricating oil composition may contain other additive components, including metal detergents such as metal salts of hydroxy alkyl or alkenyl aromatic compounds, antioxidants, including phenolic-type and amine-type compounds in an amount of about 0.05 to 3.0 wt% per total amount of the engine oil, and antiwear agents, including phosphates and phosphites. Ho allegedly allows for the addition of extreme pressure agents to the lubricating oil compositions, including zinc dialkyldithiophosphates and six other types of extreme pressure agents, but does not require the addition of zinc dialkyldithiophosphate to the composition.

The Examiner acknowledges that Ho does not teach adding to the composition a specific phosphorus acid ester compound, that of a triphosphate having Formula (1) as claimed. However, the Examiner argues that, as taught by Minami and Nishikawa, described previously, such triphosphate compounds are well-known in the art as antiwear agents in lubricating oil compositions. Accordingly, the Examiner concludes that it would have been obvious to one having ordinary skill in the art at the time of the invention to have added the triphosphate compound of Minami or Nishikawa to the oil composition of Ho because Ho allows for the addition of phosphates and phosphites to the lubricating oil compositions as anti-wear agents.

In response to Applicants' previous arguments, the Examiner maintains that Ho teaches that the lubricating oil composition may contain other additive components, including metal detergents such as metal salts of hydroxyl alkyl or alkenyl aromatic compounds, and that metal salicylates are examples of such detergents. The Examiner takes the position that a neutral metal salicylate would have a metal to detergent ratio of 1 which meets the claimed limitation of 3 or less. Applicants again respectfully traverse this rejection as follows.

Ho discloses a variety of metal detergents at col. 5, lines 38-45. However, Ho does not teach or suggest the use of the claimed salicylate detergent. The Examiner argues that metal salicylates are an example of metal salts of hydroxyl alkyl or alkenyl aromatic compounds. To the contrary, Ho teaches only "sulfurized or unsulfurized metal salts of multi-hydroxyl alkyl or alkenyl aromatic compounds" (col. 5, lines 39-40), but does not teach metal salts of hydroxyl alkyl or alkenyl aromatic compounds. That is, the claimed metal salicylates are not included in the types of detergents taught by Ho. Furthermore, Ho is completely silent as to the claimed sulfur content.

Accordingly, Applicants respectfully submit that even the proposed combination of Ho with Minami or Nishikawa would not teach or suggest all of the claimed elements, and further that the results exhibited by the presently claimed composition would not have been expected based on the proposed combination. Reconsideration and withdrawal of the § 103(a) rejection based on Ho in view of Minami or Nishikawa are respectfully requested.

In view of the preceding Amendments and Remarks, Applicants respectfully submit that the pending claims are patentably distinct from the prior art of record and in condition for allowance. A Notice of Allowance is respectfully requested.

Respectfully submitted,

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November 2, 2009

(Date)

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Enclosure: Request for Continued Examination (RCE)